

WHAT IS CLAIMED IS:

1. A rheology testing device for measuring viscosity characteristics of a coating fluid, comprising:

    a container for holding the coating fluid and having an outlet;

    a capillary tube connected to the outlet, the capillary tube having a diameter of between 0.010 inches and 0.050 inches;

    pressure means for pressurizing the container and the coating fluid held in the container and regulating the pressure to produce a predetermined shear rate in the fluid through the capillary tube; and

    a pressure gauge operably connected to the container for measuring the pressure inside the container.

2. A device according to claim 1, wherein the capillary tube is removable from the outlet.

3. A device according to claim 2, further comprising a second capillary tube having a second diameter between 0.010 inches and 0.050 inches, the second diameter being different from the diameter.

4. A device according to claim 1, wherein the capillary tube is between 0.10 inches and 6 inches long.

5. A method for determining the rheology of a coating fluid, comprising:

    providing a testing device having a container, a pressure gauge connected to the container and a capillary

tube at an outlet of the container, the capillary tube having a smaller diameter than the outlet;

placing a sample of the coating fluid into the container of the testing device;

selecting a coating fluid shear rate corresponding to a process shear rate of a coating application process;

pressurizing the coating fluid sample to produce a predetermined flow rate through the capillary tube corresponding to the selected coating fluid shear rate; and

reading the back pressure on the coating fluid sample from the pressure gauge.

6. A method according to claim 5, further comprising selecting the capillary tube from a plurality of capillary tubes each having different diameters.

7. A method according to claim 5, wherein the coating fluid shear rate is selected to be one of 2,000/sec, 20,000/sec, 62,000/sec, 63,000/sec, 300,000/sec, and 500,000/sec.

8. A method according to claim 5, further comprising using the back pressure reading to determine an upper coat weight limit for the coating fluid.

9. A method according to claim 5, further comprising using the back pressure reading to determine a pinhole limit for the coating fluid.

10. A method for determining and adjusting the rheology of a coating fluid used with a coating application die, wherein the coating application die is not designed specifically for the coating fluid, the method comprising:

providing a testing device having a container, a pressure gauge connected to the container and a capillary tube at an outlet of the container, the capillary tube having a smaller diameter than the outlet;

placing a sample of the coating fluid into the container of the testing device;

selecting a coating fluid shear rate corresponding to a process shear rate of the coating application die;

pressurizing the coating fluid sample to produce a predetermined flow rate through the capillary tube corresponding to the selected coating fluid shear rate;

reading the back pressure on the coating fluid sample from the pressure gauge;

determining if the rheology of the coating fluid is acceptable for the coating application die using the back pressure reading.

11. A method according to claim 10, further comprising adding a rheology modifier to the coating fluid to make a modified coating fluid if the coating fluid is not acceptable for the coating application die, followed by repeating the steps of placing a sample of the modified coating fluid through determining if the rheology of the modified coating fluid is acceptable.

12. A method according to claim 10, wherein the coating fluid shear rate is selected to be between about 2,000/second and 20,000/second.

13. A method according to claim 12, further comprising selecting the capillary tube from a plurality of capillary tubes each having different diameters.

14. A method according to claim 10, further comprising selecting the capillary tube from a plurality of capillary tubes each having different diameters.

15. A method according to claim 14, wherein the plurality of capillary tubes have diameters ranging from 0.010 inches to 0.050 inches.